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WPI Abstract Accession No. 98-053583 [06] &
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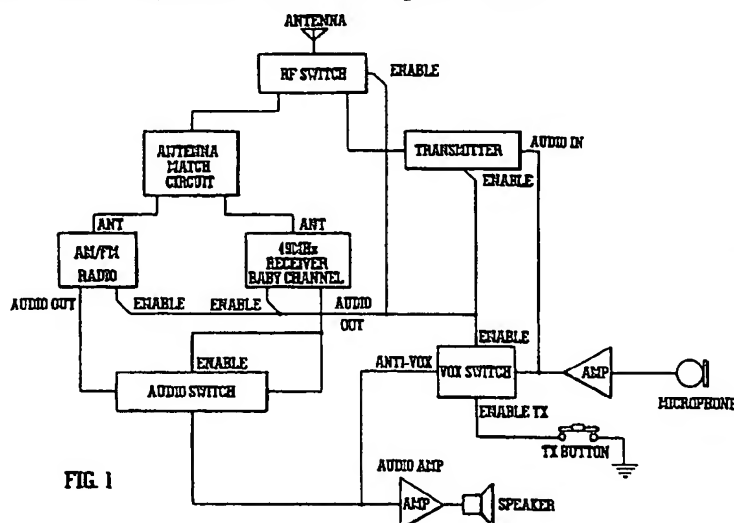
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(54) Abstract Title

Combined baby monitor and audio-visual device

(57) A wireless monitoring system comprising a first unit (Fig 2 not shown) incorporating a microphone for detecting sounds in the vicinity of said first unit and a transmitter to transmit an audio signal when said sounds exceed a predetermined threshold level, and a second unit (Fig 1) including a receiver for receiving said transmissions from said first unit and an audio amplifier and speaker for outputting said audio signal when detected, wherein said second unit is combined with another electronic device, the functioning of which is temporarily interrupted upon detecting a signal received from said first unit. The other electronic device may be an AM/FM radio, CD or cassette player, mini-tv or electronic game. On receipt of the transmission from the first unit via the antenna, baby channel receiver controls an audio switch to allow the baby sounds to be relayed through an audio amplifier and loudspeaker. Provision is also made whereby a transmit button enables voice signals from a microphone in the second unit to be passed via the vox switch to a transmitter for sending back to the first unit establishing an intercomm connection. Reception at the first unit is controlled such that two way communication is possible, while monitoring is maintained.



At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

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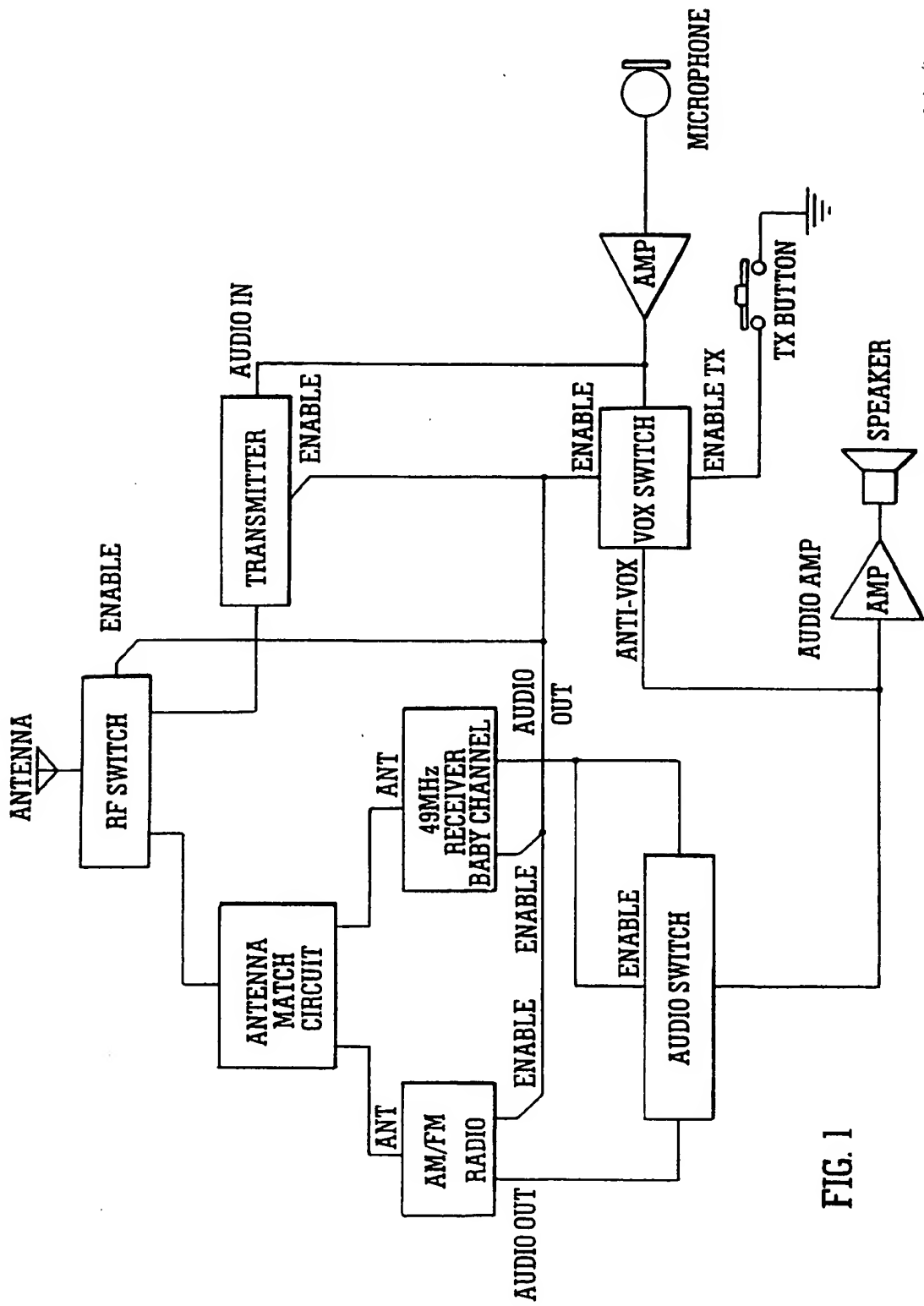


FIG. 1

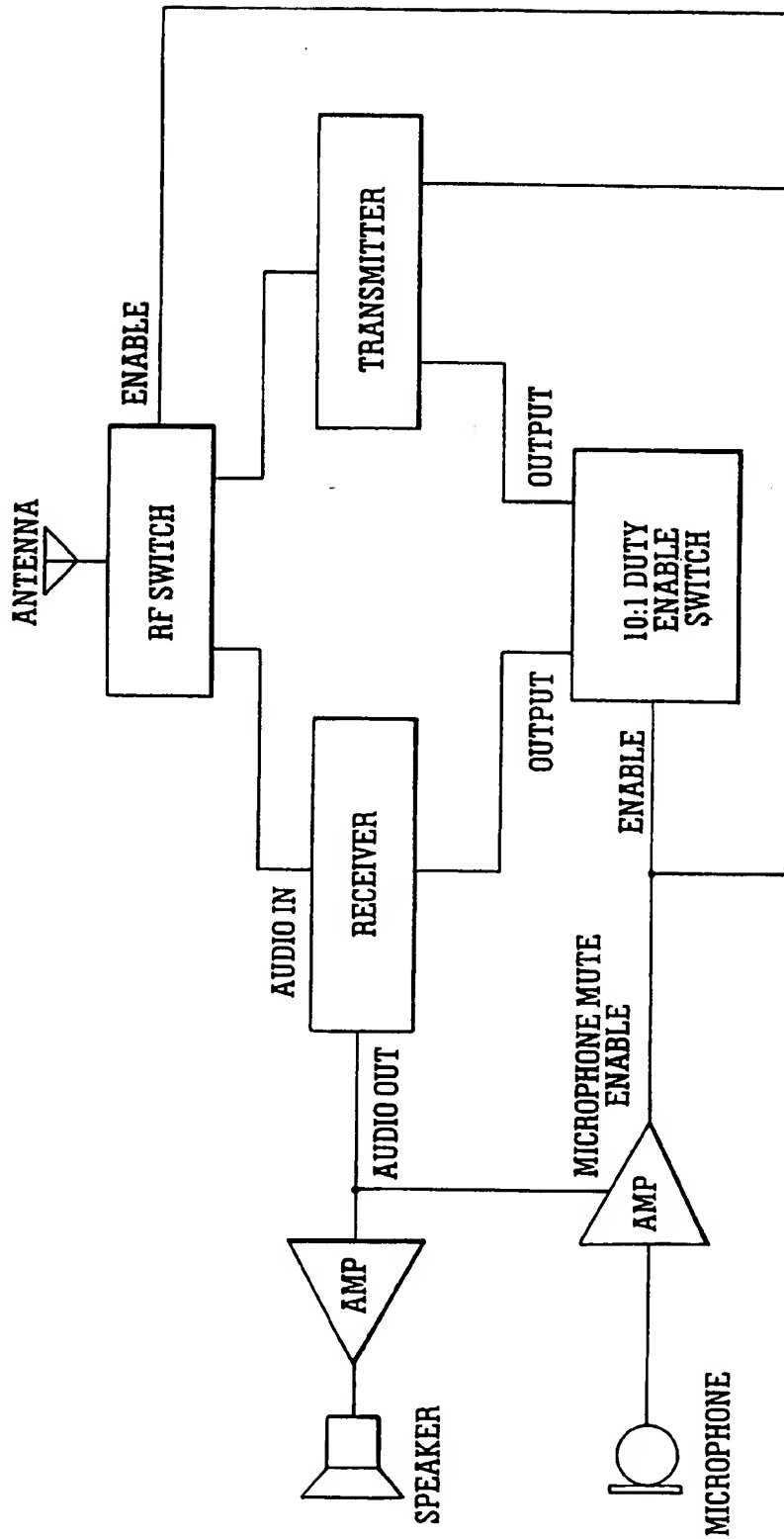


FIG. 2A

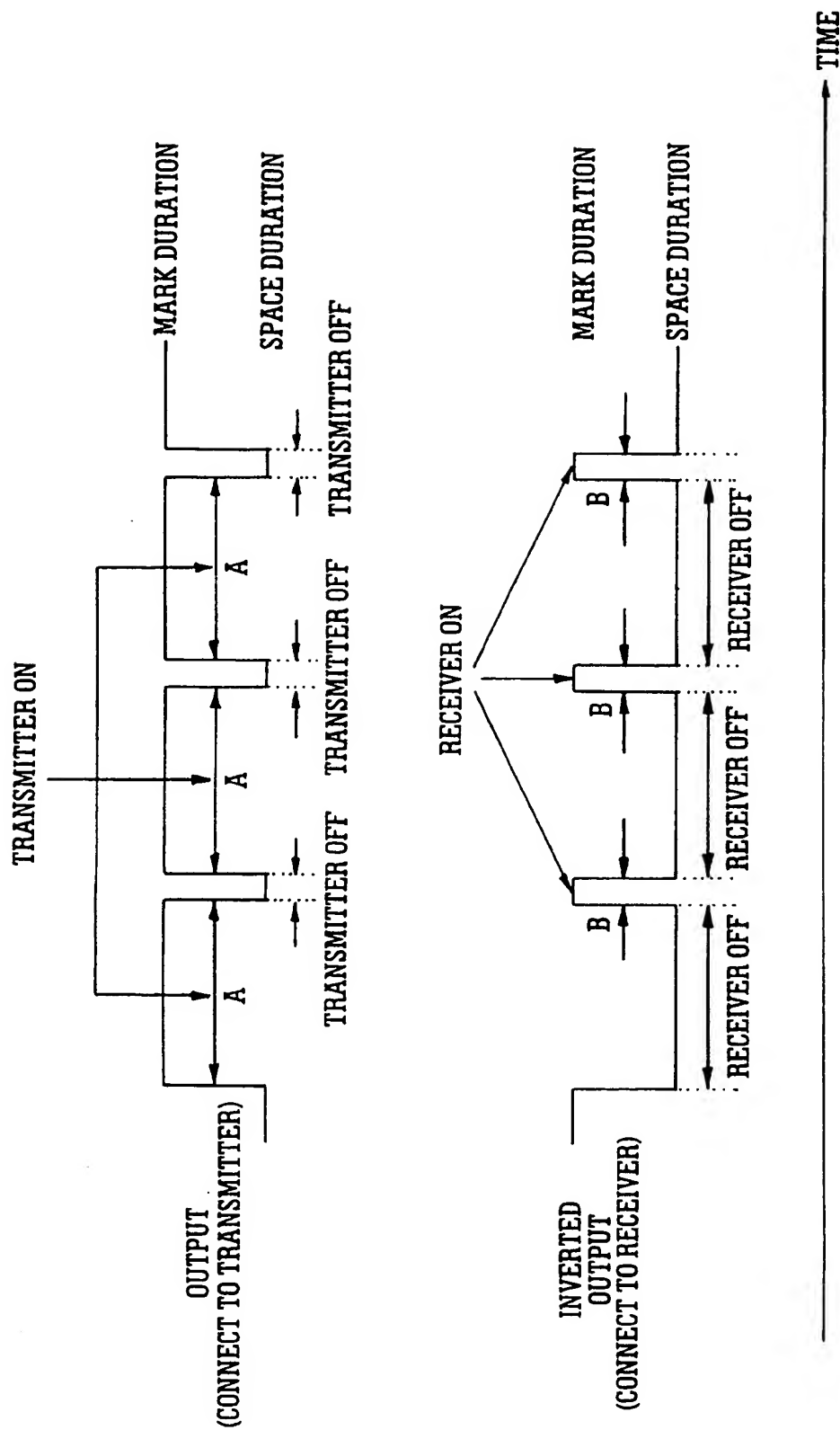


FIG. 2B

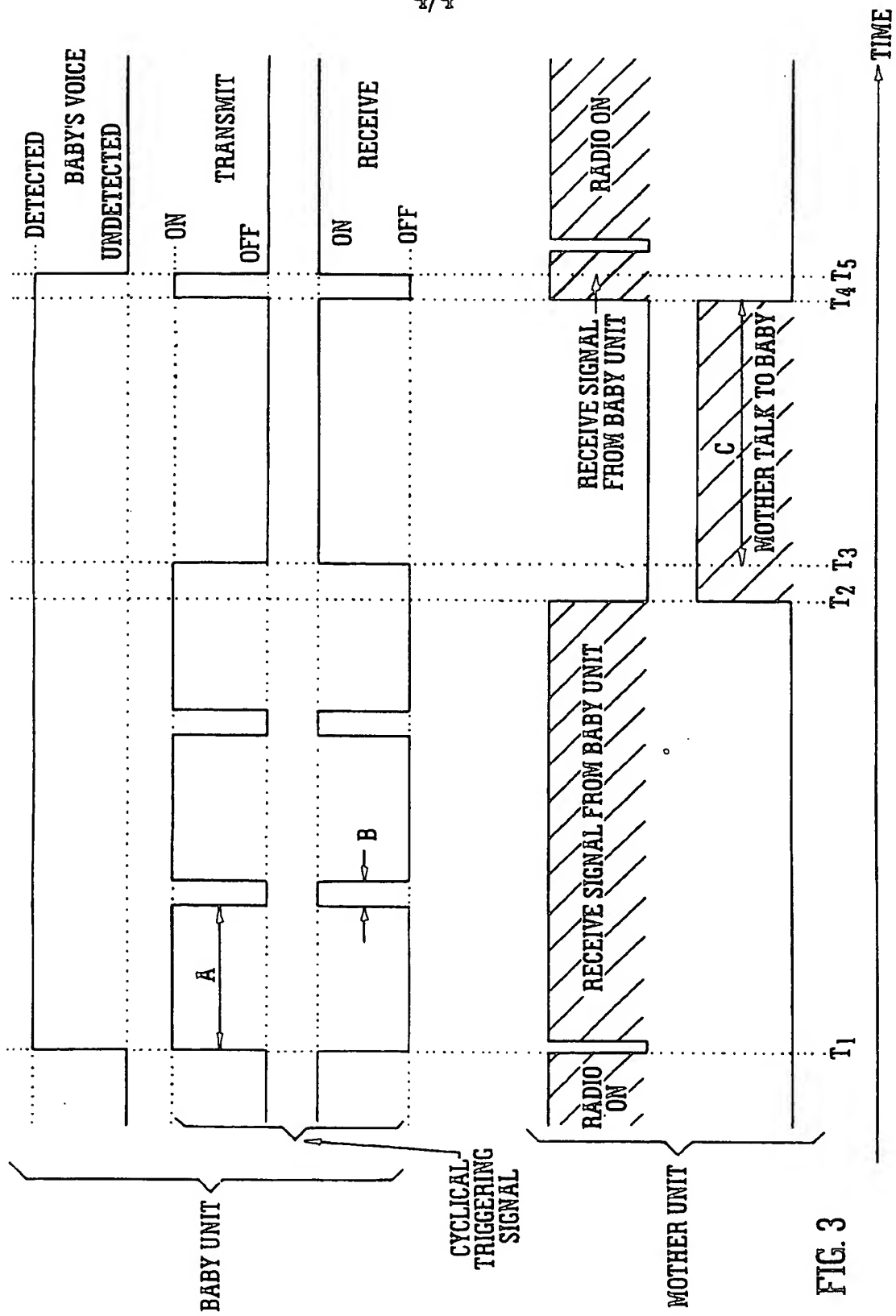


FIG. 3

COMBINED BABY MONITOR AND RADIO

The present invention relates to a "baby" monitor comprising a first, "baby" unit which is locatable in the same room as a baby or person to be monitored and a second "mother" unit to be located near or carried around by a parent or another person monitoring the baby. Such simple monitors are known operating, for example, by means of a radio link between the mother and baby unit, the mother unit being tuned into transmissions from the baby unit.

In order to provide a more useful unit, it is desirable to be able to combine the mother unit with some other electronic device whilst enabling the monitoring adult to listen in whenever the baby or child cries. Accordingly, it is an object of the invention to provide a combined baby monitoring system comprising a baby monitoring unit and a mother "listening" unit which is combined with another electronic device which may be usefully used by the parent or monitoring adult, e.g. a baby sitter.

According to the present invention there is provided a wireless monitoring system comprising a first unit incorporating a microphone for detecting sounds in the vicinity of such first unit and a transmitter to transmit such sounds when such exceed a predetermined threshold level, and a second unit including a receiver for receiving transmissions from said first unit and including an audio amplifier and speaker for outputting said sounds when detected, wherein said second unit is combined with another electronic device, the functioning of which is interrupted when a signal is received from said first unit.

Preferably, both the first and second units include receiver and transmitter means enabling two-way communication between the two units. The electronic device

incorporated in the second unit is preferably an AM/FM radio, although it is envisaged that other types of devices, e.g. a music-cassette player, CD player, mini T.V. or electronic games device could equally be incorporated according to preference, the primary condition being that the operation of such device can be interrupted when a signal is received from the first unit. Further, the second unit can equally send a transmission to the first unit so that such could effectively be utilised as an intercom type device, the first unit returning to its normal configuration as soon as any such transmission is terminated.

The present invention will be described further, with reference to the accompanying drawings, in which:-

Fig. 1 illustrates a block diagram of the second "mother" unit;

Fig. 2a illustrates the first "baby" unit;

Fig. 2b illustrates the triggering signal for the first "baby" unit; and

Fig. 3 illustrates the timing diagram illustrating the relationship between the first and second units.

In a preferred embodiment the monitoring system of the present invention comprises a first "baby" unit, the block diagram for such can be seen in Fig. 2a and a second "mother" unit block diagram for which is shown in Fig. 1.

Referring firstly to the mother unit of Fig. 1, such includes two radio receivers, one transmitter and two switching circuits. The first receiver comprises an AM/FM radio, the second receiver comprises a unit for monitoring signals from the baby unit on a predetermined frequency, in the preferred embodiment, such frequency is 49MHz. The mother unit utilises a VOX circuit, which is used to connect the audio amplifier to the signal from a radio broadcast or the signal from the baby unit automatically.

If the mother unit receives a signal from the baby unit, it will disable the radio function and connect the audio amplifier to the signal from the baby unit to enable the user to hear sounds from the baby and take appropriate action. If no further signal is detected from the baby unit the mother unit will return to the radio mode after a short delay. Additionally, the mother unit may transmit a signal via its transmitter upon operation of a transmission (Tx) button. The mother unit also includes a microphone for enabling the user to speak to the baby unit from the mother unit and an audio amplifier and speaker for outputting the signals received, either from the radio, or from the baby unit.

The mother unit preferably has two available modes of transmission, namely automatic and manual. In the automatic mode, the mother unit monitors the surroundings and if a signal is detected which is bigger than a predetermined threshold level, the mother unit will transmit a signal to the baby unit enabling the baby unit to listen to the mother unit. Owing to the characteristics of a VOX circuit, the sound from the speaker in the mother unit will not effect signal detection from the surroundings. In manual mode, the transmit button (Tx) must be pressed for transmission to be initiated. The functioning of the combined radio is disabled during both of the transmission modes.

If the mother unit should receive a signal from the baby unit, the audio switch will disable the radio's output and connect the audio amplifier to the signal from the baby unit through the 49MHz receiver, so that the user can hear the baby's sounds and take appropriate action.

Referring now to the baby unit, this comprises a receiver and a transmitter together with a switching circuit. During normal use, if no signal is detected from

the surroundings, the baby unit acts as a receiver and receives signals from the mother unit. However, if the surrounding signal is bigger than the threshold level, the switching circuit is enabled. The threshold level is adjustable to enable the level of sound likely to trigger the device and enable the switching circuit, i.e. the sensitivity of the device is adjustable. The switching circuit generates a cyclical trigger signal at a constant frequency to determine receiver and transmitter modes. This triggering signal is a square pulse with an unbalanced mark/space ratio, as shown in Fig. 2b. The nominal and inverted output of the switching circuit are connected to the transmitter and a receiver respectively. Thus, during the operation of the transmitter, such operates within the Mark duration A whilst the receiver operates during the period B, so that signal transmission and reception in the baby unit are alternate. This configuration allows the baby unit to receive signals from the mother unit during transmissions and since the reception interval B is very short, it does not effect the transmitted signal. If the baby unit should receive a signal during the reception intervals, it will continue in a received mode until no further signal is transmitted from the mother unit at which point it will revert to its normal monitoring condition.

The functioning of the device can be more clearly seen from the timing diagram shown in Fig. 3 which shows the relative operation of the baby unit and the mother unit with respect to time. Initially, the baby unit acts as a monitor detecting any sounds from the baby and when such is detected at T_1 , the switching circuit in the baby unit generates a cyclical triggering signal and during the period A transmits the signal to the mother unit whilst continuing to monitor signals from the mother unit during the period B. It should be noted that, at the mother unit, the radio is disabled at T_1 , as soon as the signal is detected from the baby unit, and continues to receive the

signal from the baby unit until a transmission is made from the mother unit at time T_2 . At this point the mother unit ceases to receive any signals from the baby unit and switches the baby unit to a receive mode enabling the mother unit to talk to the baby unit at time T_3 following in the inhibition of the triggering pulse in the baby unit. When the mother has terminated transmission at T_4 the triggering pulse in the baby unit continues to generate until completion of a transmission from the baby unit at T_5 . After a further short delay the mother unit reverts to its normal operating mode enabling the radio to operate until a subsequent transmission is received from the baby unit.

It will be seen that the device of the present invention enables a mother or parent or other supervising adult to enjoy, for example, a radio transmission whilst being able to monitor a baby or child in another room, such device automatically cutting off the radio reception whenever a sound is detected from the baby, enabling the parent to immediately communicate with the baby to soothe such, or if necessary, to attend upon such. Further, whilst it is envisaged that such would primarily be utilised in combination with a standard radio receiver, the device of the present invention could equally be operated with other electronic devices, the primary need being that such is able to provide radio communication between the mother and baby unit and being able to interrupt the operation of whichever device is incorporated in the mother unit in order to enable two-way communication if necessary.

Further whilst the device has primarily been described for "baby monitoring", such could equally be applied to monitoring sick or elderly persons in a similar manner.

CLAIMS

1. A wireless monitoring system comprising a first unit incorporating a microphone for detecting sounds in the vicinity of said first unit and a transmitter to transmit an audio signal when said sounds exceed a predetermined threshold level, and a second unit including a receiver for receiving said transmissions from said first unit and an audio amplifier and speaker for outputting said audio signal when detected, wherein said second unit is combined with another electronic device, the functioning of which is temporarily interrupted upon detecting a signal received from said first unit.
2. A wireless monitoring system as claimed in claim 1, wherein both said first and second units include receiver and transmitter means enabling two-way communication between the two units.
3. A wireless monitoring system as claimed in claim 1 or 2, wherein which the electronic device incorporated in the second unit is an AM/FM radio receiver.
4. A wireless monitoring system wherein the electronic device is selected from the group comprising, a music cassette player, a CD player, mini T.V., or an electronic games device.
5. A wireless monitoring system as claimed in claim 1, in which said second unit comprises two radio receivers a transmitter and two switching circuits, said first receiver comprising an AM/FM radio, said second receiver comprising a device for monitoring signals received from the first unit on a predetermined frequency, and further comprises a VOX circuit for connecting the audio amplifier to the signal from a radio broadcast, or the signal from the first unit, selectively, whereby, if the second unit detects a

signal from the first unit, the radio function is disabled and the audio signal from the first unit is output.

6. A wireless monitoring device as claimed in claim 5, in which said second unit includes a microphone and a transmission (Tx) switch for enabling voice transmission from said second unit to said first unit, which, following termination of such transmission, automatically reverts to a "listening" mode and subsequently enables functioning of the radio receiver.

7. A wireless monitoring system as claimed in claim 6, in which said second unit has two available transmission modes, in a first "automatic" mode said second unit is capable of monitoring the ambient noise and upon detecting a signal higher than a first predetermined level, enables the transmitter to transmit a signal to said first unit, and a second "manual" mode in which a transmit switch must be actuated for a transmission to said first unit to be initiated.



Application No: GB 9702340.2
Claims searched: 1-7

Examiner: John Betts
Date of search: 2 July 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.P): G4F(FAA, FAB, F14, F10XX) G4N (NDAX) H4K (KFH)
Int CI (Ed.6): G08B 3/00 3/10 5/00 5/22 5/36 7/06 13/16 21/00 25/00 25/01 25/10
H04M 11/00 11/04
Other: On-line: WPI, EPODOC

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB2253082 A (Soundout)	
A	EP0113533 A2 (Thorn EMI)	
A	WPI Abstract accession No.98-053583 [06] & DE19625608 (Stemme) (see abstract)	

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